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of Nubk Jebel at 12:20, and obtained the first view of Um Shaumur in 25m. later. At 1:30 they rested for an hour, at a good spring under a rock in the Wady Râhabah, 300 yards west of the track, and reached an excellent watering-place in a rocky glen, called Wady Ghadu, at 4:55. The next morning they started at 4:55 A.M., and, delaying an hour for breakfast, descended to the ruined convent of Tiwahat el Deir at 9:15. Thence they attempted the ascent, and reached the small central peak; but were checked by a rock that blocked the only access in attempting the main summit. They returned, and finally reached their former bivouac in the Wady Râhabeh at 6 P.M.; and seven hours' travel in the morning of the next day brought the main body of the party back to St Catherine's.

There was a good sprinkling of aromatic herbs on the mountain, but no fennel was observed to justify the presumed derivation of the word Um Shaumur (Mother of Fennel); neither were any of the mysterious sounds heard, which are said to be of frequent occurrence in its neighbourhood. As regards the hypothesis once entertained of Um Shaumur being the Mountain of the Law, Mr. Howlett states there did not appear to be an acre of ground anywhere near Um Shaumur fit for the purposes of an encampment.

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#### 5. *The Alps of Dauphiné.* By F. F. TUCKETT, Esq., F.R.G.S.\*

FEW portions of the mountain system of Europe have been less thoroughly explored than the lofty group of peaks included between the rivers Durance, Drac, and Romanche, and occupying portions of the ancient province of Dauphiné,—the modern departments of the Isère and Hautes Alpes. The area of the entire massif may be roughly computed at about 1100 square miles; but the glacier-developing portion to which the accompanying map is confined, covers little more than half this surface. The mean elevation is very considerable, as the following statements and the general narrowness of the valleys would indicate:—4 peaks above 13,000 and under 14,000 feet; 17 peaks above 12,000 and under 13,000 feet; 29 peaks above 11,000 and under 12,000 feet. Its glaciers (primary and secondary) exceed 100; and under this head, as well as in the height and number of its summits, it may almost challenge comparison with the system of the Finsteraarhorn, though, as respects glaciers, the latter has certainly the advantage in size from the greater extent of *névé*, a result of its less precipitous formation.

From time to time notices of its topography and physical features have appeared, and the writings of Ladoucette, M. Élie de Beaumont, Professor Lory, and our own countryman, Principal Forbes, have called attention to many of its more striking peculiarities. Within the last four or five years various members of the Alpine Club have penetrated still further into its recesses, and a series of papers in the second series of 'Peaks, Passes, and Glaciers' give evidence of their activity and enterprise. Up to the present time, however, the absence of any reliable map, added to the really intricate relations of the principal summits and valleys, and the fact that few of the explorers had an opportunity of intersecting the district in various directions and studying it in detail, have rendered it difficult to arrive at a clear conception of the mutual relation of its parts.

Under these circumstances I ventured to think that a fresh examination by one who could avail himself of the labours of his predecessors would supply some desiderata, and I therefore devoted ten or twelve days of last July to this

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\* A photographic reduction of the unpublished M.S. map of Dauphiné, by the Dépôt de la Guerre, has been presented by Mr. Tuckett to the Society. His routes and corrections are marked upon it.

special object. It was important before getting on the ground to obtain all the preliminary information possible, and I was especially desirous of consulting such MS. maps or notes as might be available for my purpose in the Dépôt de la Guerre at Paris. Thanks to the kindness of my friend, Principal Forbes, in putting me in communication with M. E. de Beaumont, and the influence which the latter gentleman was good enough to exert in my favour, I met with the most courteous reception from General Blondel, chef of the Dépôt. Not only did he grant me the utmost liberty in making extracts from the notes of the officers engaged on the national survey, but he allowed the draughtsmen of the bureau to execute for me a beautiful copy of the most important portion of the MS. sheets from which the "Feuille Briançon" will, in the course of five or six years, be produced. I was also furnished with a theodolite by Troughton and Simms (kindly lent by my friend, Mr. W. Mathews, jun., of Birmingham), a mountain-barometer by Negretti and Zambra, an aneroid by Secrétan, boiling-point thermometer by Casella, a "knapsack sleeping-bag" for bivouacking, a supply of portable soup, and a boiling-water apparatus with Russian furnace by Stevenson, of Edinburgh.

Thus equipped, I proceeded through the Vaudois valleys to the scene of operations, testing the capabilities of my knapsack sleeping-bag *en route* by spending a night of snow, fog, and wind, on the summit of Monte Viso. Thanks to the beautiful weather which prevailed throughout my stay in Dauphiné, I was able to pursue my investigations under the most favourable conditions; and in the map now presented to the Royal Geographical Society, together with the hypsometrical table and outlines, are combined the principal results, as well as the important mass of information for which I am wholly indebted to the authorities of the Dépôt de la Guerre.

It is almost impossible, within the limits of a short notice, to explain in detail the conclusions at which I have arrived; but a few additional remarks seem essential. In the first place, I have much pleasure in stating that I find the MS. map of the officers of the État Major extremely accurate on the whole. Nevertheless, there are some mistakes in nomenclature, a few errors in the hypsometrical details, and several omissions, which it was necessary to correct or supply, whilst my expeditions enable me to add three new and very fine passes, the height and position of which I have laid down on the map. In other respects this is merely a photographic reduction of the MS. of the État Major (scale  $\frac{1}{400000}$ ); but as the engraved sheet will not be accessible to the public till 1867 or 1868, it appeared desirable to deposit a copy with the Royal Geographical Society for general reference.

In order to obtain a survey of the whole district, I first ascended the highest peak of the Grand Pelvoux (previously reached by Messrs. Whymper, Macdonald, and Reynaud, in 1861), and installing the theodolite and barometers on the summit, succeeded, during a stay of four hours, in obtaining a series of observations which enabled me to determine the previously unknown height of the point in question, as well as many other details which need not be enumerated here. The results of the theodolite and barometer are remarkably accordant, and justify the belief that 3954 mètres (12,973 feet) represent very nearly the absolute altitude of my station. This mountain must, therefore, take rank in future as the third in order of height of the group; the Ecrins lying about 4000 mètres to the north-west, and the Meije or Aiguille du Midi de la Grave still further to the north, being both of superior elevation (13,462 and 13,081 feet respectively). At the same time I was enabled to detect an error in the identification by Mr. Whymper (in the paper in 'Peaks, Passes, and Glaciers,' already alluded to) of the mountain known in the valley of La Berarde as l'Alefroide or l'Ailefroide. The peak so designated by him proves on examination to be only one of half-a-dozen summits in the ridge constituting the Pelvoux proper, and stretching out in an easterly direction at

right angles to the watershed, which divides the valleys of La Berarde and Vallouise. The true Alefroide is situated about a mile further to the west, and is the highest point of the main ridge or watershed south of the Ecrins. A comparison of the map, and the outlines taken from the Col de l'Agnello, and near Guilestre, with the description and sketch of Mr. Whympers, will, I think, prove my correctness and explain the misconception.

The series of theodolite readings taken on the Pelvoux, establish beyond question the supremacy of the Ecrins, and completely confirm the altitude of 4103 mètres (13,462 feet) assigned to it by the French engineers. This, the culminating point of the entire group, has three summits, all of which are higher than the loftiest peak of the Pelvoux, being respectively 4103, 4083, and 3980 mètres (13,462, 13,396, and 13,058 feet). As will be seen by the map, it lies in a north-westerly direction, and at a distance of about 4000 mètres from the Pelvoux, from which it is separated by the whole width of the Glacier Noir. The principal summit appears to be a three-sided pyramid, with precipitous faces of rock on the side of La Berarde, and the Glacier Noir, and a more rounded form covered with enormous masses of snow and névé towards the north-east, or in the direction of the upper plateau of the Glacier Blanc (L'Encula). Lastly, it is the identical mountain figured by Forbes in his 'Journal of Excursions in Dauphiné,' under the name of "Montagne d'Oursine," as may be at once seen by comparing my outline from above Les Étages, with his drawing taken from nearly the same spot. There is no "Montagne d'Oursine" (the name found on the antiquated map of Bourçet, which, however, is the only tolerably accurate one accessible to the public); or rather, this name, that of the "Pointe d'Arcines," and "Les Ecrins," all refer to one and the same summit immediately behind, and nearly due east of, La Berarde.

It only remains to allude to the new passes effected by me. The first, which I have called the Col des Ecrins, leads from Ville Vallouise to La Berarde, and crosses the main ridge which separates their respective valleys at a point to the north of the Ecrins, and between it and the St. Roche Faurio. On the eastern side of the Pass, the route lies up the course of the Glacier Blanc; whilst on the west the descent is accomplished by the Glacier de la Bonne Pierre. The time occupied from Ville Vallouise, exclusive of stoppages, was 10½ hours, and the height, deduced from a comparison of the barometer reading with four inferior stations, is 3415 mètres (11,204 feet), though I have some reason to believe that 3350 mètres would probably be nearer the truth.

Two days later, on the 14th July, I ascended the Glacier de la Pilatte (the Condamine of Bourçet), at the head of the valley of La Berarde, and recrossed the watershed to Ville Vallouise by another new pass, which I have called the Col du Selé, from the glacier of that name, which descends from it on the east to the head of the Combe de Sapienière. It lies at the south foot of the Alefroide, and furnishes the easiest existing means of communication between the respective valleys. The height deduced from the mean reading of two boiling-point thermometers, carefully corrected and compared with several inferior stations, is 3302 mètres (10,834 feet). The time occupied, excluding halts, was only nine hours, and no difficulties of a serious nature were encountered. The Col de la Tempe, at the head of the Glacier Noir, and nearly intermediate between the Ecrins and the Alefroide, was formerly the only pass by which a direct intercourse was carried on between the inhabitants of the Val St. Christophe and those of the Vallouise, and the discovery of an easier means of communication will, I hope, prove of local advantage.

The third Pass is probably not likely to prove so available for general purposes, but its extreme grandeur renders it very attractive to the mountaineer. This route, which is the same as that of the Col des Ecrins as far as the upper plateau of the Glacier Blanc, leads direct from Ville Vallouise to La Grave in

ten to eleven hours, traversing the ridge which forms the north boundary of the Glacier Blanc, at a height of 3308 mètres (10,853 feet), and descending precipitously to the Glacier d'Arsines. The views to the south and south-west of the Pelvoux, Alefroide, and Ecrins, and to the north-west of the Grande Ruine and Aiguille du Midi de la Grave (La Meije), are unsurpassed in sublimity and interest by any in the whole range of the Alps with which I am acquainted.

It is worthy of remark that in the case of each of the three passes just described, the névés of the Glaciers on the side of the Val Vallouise (the Glaciers Blanc and du Selé) are situated at an elevation of from 900 to 1500 feet above those of the reverse slope (the Glaciers de la Bonne Pierre, de la Pilatte, and d'Arcines)—a circumstance clearly attributable to the greater abruptness of the declivities of the latter, which prevents the accumulation of snow. I owe it to my guides, Michael Croz, of Chamouni, and Peter Perrin, of Zermatt, to state that my success was, in a large measure, due to their assistance; and I cannot conclude without a word in praise of the admirable efficiency of the knapsack sleeping-bag which constituted my almost habitual dormitory during my stay in Dauphiné. It was slightly modified in construction and material from a pattern kindly lent me by Mr. Galton, who imported the general idea from the Pyrenees.

Much yet remains to be accomplished in the way of exploration amongst the mountains of Dauphiné. I have done little more than introduce some sort of order into the confusion in which the district was previously involved, and shall be amply rewarded if I may be allowed to hope that I have contributed, in however slight a degree, to facilitate future research. Of the large number of lofty peaks enumerated in the hypsometrical table, none but the two highest summits of the Pelvoux and five or six others of inferior rank (used as stations by the officers of the *Etat Major*) have been ascended. A spirited assault was, indeed, made on the Ecrins by Messrs. Mathews and Bonney, a few weeks after my visit; but the state of the snow rendered it abortive, and the monarch of the group still remains as an incentive to the adventurous climber, whilst the Aiguille du Midi de la Grave (La Meije), the Alefroide, and a score of other lofty peaks, challenge attack.

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6. *Latest Intelligence from Mr. BAKER in a Letter to J. ARROWSMITH, Esq., dated Khartum, 8th Nov., 1862.*

I LEAVE this on the 1st December with three vessels conveying my transport animals—four horses, four camels, ten mules, ten asses, with an escort of forty-five picked men all armed with double-barrelled guns and rifles, and about the same number of sailors. All my pack-saddles, leather-bags, &c., are so well arranged that I hope to have no trouble in rapid travelling. My animals are of various kinds for various work—thus, if the climate be unpropitious for some, it may nevertheless agree with the others. I have taken such care in preparing for the journey, to the minutest detail, that I trust to succeed.

Hitherto all attempts at an extended exploration beyond Gondokoro have broken down for want of means of transport, the expense of conveying animals from Khartum being very great. My expedition, as it sails from Khartum, will be able to disembark and march on the same day, if necessary. Thus I shall not lose a day upon the White Nile voyage, except at the junctions of the Sobat and the Gazal for observations. I shall push direct for Gondokoro, and from thence to the Cataract. At the last point I shall disembark, and order all the boats to return to Khartum, while I proceed on my land-journey.

My first point will be the ivory dépôt of one Andrea Debono, which is the